

## USE OF AKDOT&PF ATM 212, ITD T 74, WSDOT TM 606, OR WFLHD HUMPHRYS CURVES

### Background

01 Coarse-grained granular soils are free-draining and  
have little or no cohesion. These soils are,  
therefore, not particularly well suited for the  
02 moisture-density relations procedures of AASHTO  
T 99, or AASHTO T 180. Transportation agencies  
have developed specialized test methods that are  
hybrids of those moisture-density procedures and  
methods that employ compaction under load with  
vibration. Those methods include:

- AKDOT&PF's ATM 212
- ITD's T 74
- WSDOT's TM 606
- WFLHD's Humphrys

### Description of Procedure

04 In these tests, material is compacted in a mold and  
in a manner similar to those used in a Proctor test,  
after which the material is further compacted  
through a combination of applied loads and  
vibration. A laboratory maximum dry density is  
determined, as is the percent of material passing a  
certain sieve such as the 4.75 mm (No. 4). A  
number of determinations are made for different  
percentages passing the specified sieve. A graph is  
developed in which dry density is plotted versus the  
percentage of material passing that sieve. These  
tests are conducted in the agency's central lab, and  
the curve developed is a central lab function.  
Figure 1 is an example of such a curve.

05 Construction specifications will call out a percent of  
maximum dry density required for the granular  
materials used on the job. These specified values  
will be based on ATM 212, T 74, TM 606, and  
Humphrys depending on the agency.

In the field, the dry density of the granular material  
will be determined in accordance with the FOP for  
AASHTO 310. The percent of material passing the  
specified sieve will be determined for a sample  
obtained at the site of the density test. The dry

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density and percent passing values will then be compared with the curve developed in the lab for that particular granular material to determine conformance with the project specifications.

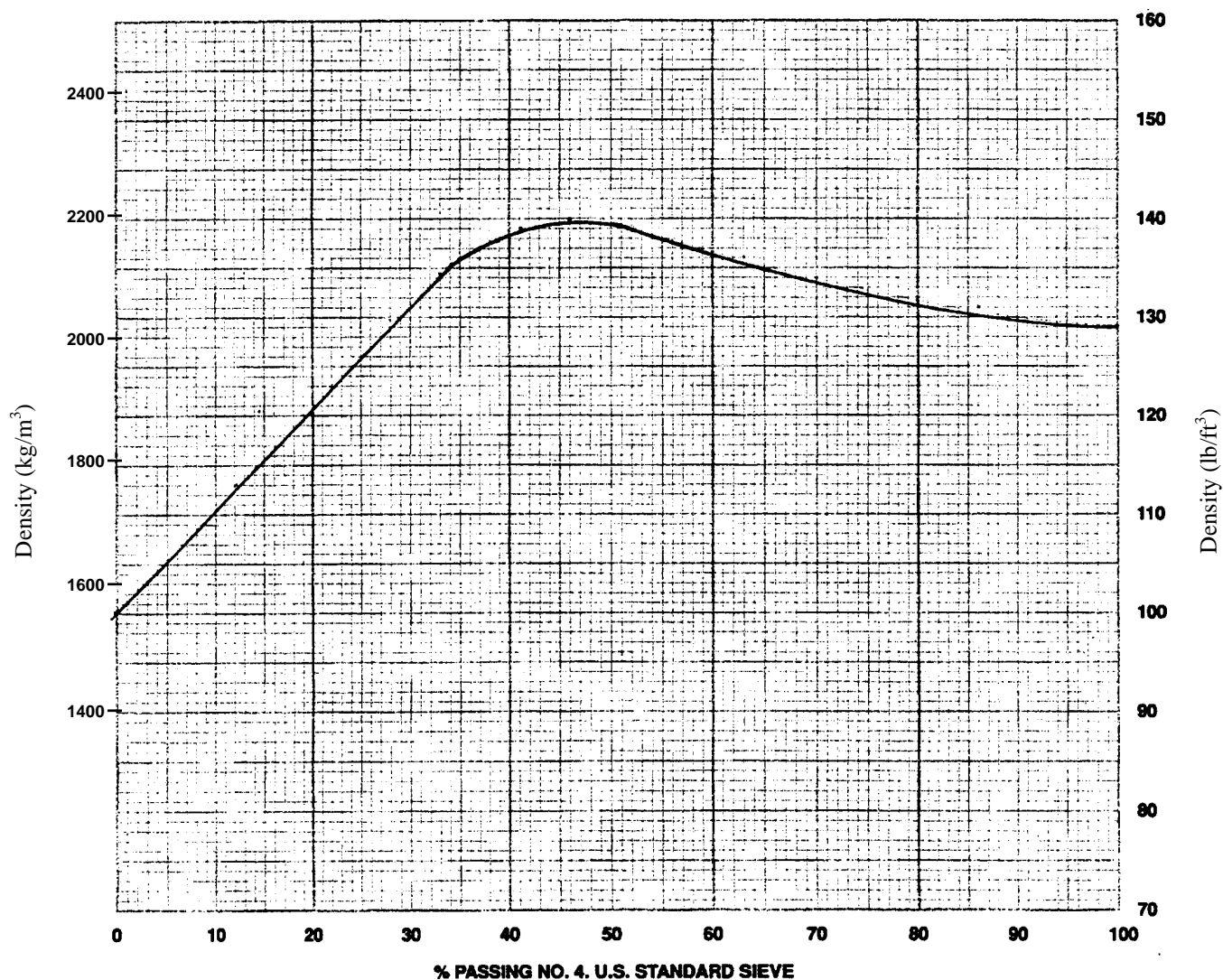


Figure 1. Maximum Density Curve Graph

### Example:

A compaction test was taken and a sample was removed from the test site per the FOP for T 310. The sample was graded over a 4.75 mm (No. 4) sieve. The following results were reported.

Dry Density from T 310 =	2141 kg/m <sup>3</sup> (metric)	137.0 lb/ft <sup>3</sup> (English)	07
Percent passing 4.75 mm (No.4) sieve =	49%		
Maximum Density =	2173 kg/m <sup>3</sup> (metric)	139.0 lb/ft <sup>3</sup> (English)	

Percent Compaction =	99%	08
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